APPLICATION
for
UNITED STATES LETTERS PATENT

SPECIFICATION

TO ALL WHOM IT MAY CONCERN:

Be it known that,
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have invented a new and useful PORTABLE COVERED WALKWAY UNIT AND METHOD FOR CONSTRUCTING A COVERED WALKWAY PATH of which the following is a specification.

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PORTABLE COVERED WALKWAY UNIT AND METHOD FOR CONSTRUCTING A COVERED WALKWAY PATH

BACKGROUND OF THE INVENTION

Related Application Data

This application claims priority from provisional application serial number 60/178,942 filed on February 1, 2000 entitled Portable Covered Walkway, the contents of which are incorporated herein by reference.

Field of the Invention

This invention relates to a system for interconnecting buildings or objects with nonpermanent structures. More particularly, the present invention relates to portable walkway units which can be employed to create walkway paths between one or more buildings or objects or areas.

Description of the Background Art

Presently, covered walkways are usually constructed in a permanent fashion. A concrete slab sidewalk is poured and permanently secured on an excavated area. The concrete slabs are secured by processes known by one skilled in the art including forming the slabs with rebar and screens secured to the ground. Poles are driven in the ground adjacent the concrete slabs and secured in the ground by means known to those skilled in the art. A roof covering the concrete slabs is attached at a top end of the poles to provide a covered walkway.

Portable buildings are often used as temporary housing for a variety of reasons. In specific, portable or modular housing is often used on school campuses. These portable classrooms are often moved to make room for additional portable classrooms or construction of permanent classrooms. In any event, walkways are required to connect the various portable classrooms to other portable classrooms or permanent structures. New safety regulations are now requiring that walkways interconnecting portable classrooms to other structures must be covered. The construction of permanent covered walkways is expensive. In addition, often times the covered walkway is destroyed in a matter of a year or two, in order to accommodate more classrooms or other structures.

The background art contains numerous examples of covered housings. For instance, U.S. Patent 2,988,810 to Wilken discloses an arched roof housing structure. The roof structure is formed from a series of pre-cut sheets of relatively thin gauge which are shaped into an arch by way of a shiftable jig. The ends of the arched sheets are secured intermediate vertical posts that are deeply embedded into the ground.

U.S. Patent 5,195,291 to Pomento discloses a spherical wooden truss frame building. The building is formed from a plurality of truss members mounted upon a circumferential foundation. The upper ends of the truss

members are joined together at a compression block. Each of the truss members is secured in the ground by way of a concrete foundation.

A covered walkway system for a parking lot is disclosed in U.S. Patent 5,279,085 to DiPaolo et al. The walkways are formed from a walk, opposing upstanding windscreens, and an overlying canopy structure. The walk can be part of the parking lot itself or it can be of a concrete construction to thereby raise the walk above the surface of the parking lot.

U.S. Patent 5,295,335 to Collier discloses a prefabricated shelter. The shelter is formed from an arched framework and an attached roof structure. The shelter also includes a ground securing structure which takes the form of a plurality of anchors. The anchors are forced into the ground beneath the shelter to secure the framework to the ground.

U.S. Patent 5,758,196 to Laing discloses an outdoor studio for use by professional photographers. The studio includes a self supporting frame constructed from modular tubular members. Disposed upon the frame is a screening apparatus, which can take the form of a scrim of fabric. Stakes, attached to tethers, are driven into the ground for stabilizing the frame.

Finally, U.S. Patent 5,768,829 to Thompson et al. discloses a temporary corridor apparatus. The apparatus is constructed from a plurality of vertical members and at least one horizontal member. Flanges are

included on the sides of the horizontal member and are adapted to engage corresponding flanges on the upper ends of the vertical members. Stakes are included for securing the bottoms of the vertical members into the ground. The entire corridor apparatus is adapted to be secured over an existing sidewalk.

Although each of the above referenced inventions achieves its individual objective, they all suffer from a common problem. Namely, they each require some type of grounding mechanism to keep the structure anchored. This drawback means that none of the referenced inventions are truly portable. As a consequence, the structures are more difficult and expensive to erect.

Furthermore, Thompson, Collier, Di Paolo and Wilken all disclose structures which are specifically for use over an existing sidewalk or walkway. As such they are not self contained and merely serve as a compliment to fix structures. This hybrid approach likewise increases the difficulty and cost of erecting the structures.

Modularity is another feature absent from the above referenced inventions. Namely, none of the inventions illustrates interconnecting a series of smaller self contained units to create elongated structures. Modularity allows elongated structures of varying lengths and geometries to

be easily and economically created.

SUMMARY OF THE INVENTION

It is therefore one of the objectives of this invention to provide a system for joining one or more buildings by way of a series of walkway units which are both modular and portable. The units allow sheltered pathways of varying lengths and geometries to be easily and economically constructed between one or more buildings.

These objectives are accomplished by providing walkway units that include a base portion formed from upper and lower planar surfaces and an intermediate periphery. A female joint portion is formed within two ends of the base. Each walkway unit further includes a series of upwardly extending supports formed within the periphery of the base. With the supports so secured, a roof is mounted upon the supports. The roof is oriented and sized such that it overlies the base. A series of lifting eyes are adapted to be interconnected to the supports. The lifting eyes permit the entire unit to be lifted and transported.

In accordance with the disclosed system, a number of walkway paths are formed by interconnecting adjacent walkways units of the series. This is achieved by connecting the female joint portions of adjacent bases. In this manner, elongated walkway paths can be made to extend between at least two or more buildings, structures, objects or areas.

The foregoing has outlined rather broadly the more pertinent and important features of the present invention in order that the detailed description of the invention that follows may be better understood so that the present contribution to the art can be more fully appreciated. Additional features of the invention will be described hereinafter which form the subject of the claims of the invention. It should be appreciated by those skilled in the art that the conception and the specific embodiment disclosed may be readily utilized as a basis for modifying or designing other structures for carrying out the same purposes of the present invention. It should also be realized by those skilled in the art that such equivalent constructions do not depart from the spirit and scope of the invention as set forth in the appended claims.

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BRIEF DESCRIPTION OF THE DRAWINGS

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawings in which:

Fig. 1 is a perspective view of one of the walkway units of the present invention.

Fig. 2 is a front elevational view of one of the walkway units of the present invention.

Fig. 3 is a side elevational view of one of the walkway units of the present invention.

Fig. 4 is a perspective view of one of the walkway units of the present invention employing an alternative joint construction.

Fig. 5 is a front elevational view of one of the walkway units of the present invention employing an alternative joint construction.

Fig. 6 is a side elevational view of one of the walkway units of the present invention employing an alternative joint construction.

Fig. 7 is a top plan view of one of the rectangular walkway units of the present invention.

Fig. 8 is a top plan view of a walkway unit with a 45 degree angle.

Fig. 9 is a top plan view of a walkway unit with a 90 degree angle.

Fig. 10 is a top plan view of a walkway unit with a 30 degree angle.

Fig. 11 is a top plan view of a walkway unit in the form of an intersection.

Fig. 12 is a top plan view of a T-shaped walkway unit.

Fig. 13 is a perspective view of a walkway unit with associated means for transporting the unit.

Fig. 14 is a top plan view of the walkway paths positioned between a number of buildings.

Fig. 15 is a top plan view illustrating the connecting plates of adjacent units.

Fig. 16 is a detailed view taken from Fig. 15.

Fig. 17 is a detailed view taken from Fig. 15.

Fig. 18 is a detailed view taken from Fig. 15.

Fig. 19 is an exploded view of two interconnected units.

Fig. 20 is an exploded view of a half cylinder connector.

Fig. 21 is a side elevational view of two interconnected units with a roof connector.

Fig. 22 is a plan view of the sloped unit for accommodating wheel chair traffic.

Fig. 23 is a side elevational view of Fig. 22.

Fig. 24 is a perspective view of a unit be lifted by way of a series of lifting eyes.

Fig. 25 is a perspective view of a lifting eye.

Fig. 26 is a side elevational view of a lifting eye

Fig. 27 is a front elevational view of a lifting eye with associated locking pins.

Similar reference characters refer to similar parts throughout the several views of the drawings.

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DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention relates to a system 10 for interconnecting two or more buildings 12 by way of a series of nonpermanent structures. The nonpermanent structures preferably take the form of covered walkway units. By utilizing the system of the present invention, buildings, such as school classrooms, can be joined by covered pathways 14 to thereby provide shelter for people traveling between buildings. The walkway units 22 of the present invention are both portable and modular. These features allow the units to be easily transported and interconnected to form pathways 14 of varying lengths and directions. The features also allow the units to be removed and stored if necessary or placed in another location. The system 10 of the present invention, as well as the associated method and apparatus, will be described in fuller detail hereinafter.

As indicated, the nonpermanent structures of the present invention preferably take the form of portable modular walkway units 22. The present invention contemplates providing walkway units 22 in various shapes and sizes. An example of one specific embodiment of a walkway unit 22 is depicted in Figure 1. This walkway unit 22 includes a base 24 formed from opposing upper and lower planar surfaces, 26 and 28 respectively. With multiple units 22 interconnected, the upper surface 26 supports the flow of

pedestrian traffic. Conversely, the lower surface 28 of the unit 22 can be adapted to be engaged by a lifting mechanism, such as a fork lift, to thereby allow for the transport of the individual unit 22. Nonetheless, in the preferred embodiment the unit 22 is lifted by way of its roof, as noted in Figure 13.

Intermediate the upper and lower surfaces is a periphery 32. As illustrated, the periphery includes two edges that form the ends 34 of the unit and are adapted to be joined with the ends 34 of other walkway units 22 in mating relation. In the preferred embodiment depicted in Figures 1-3, each end 34 of each unit 22 includes a concave female joint portion 38.

With reference to Figures 15 and 19, the manner in which the ends 34 of adjacent walkway units 22 are joined is described. Specifically, the two female joint portions 38 are interconnected by a pair of cylinders 60. The position of two cylinders 60 relative to the interconnected units 22 is best illustrated in Figure 15. Specifically, the cylinders 60 are ideally located at the outer ends of the cylindrical space created by the two female joint portions 38. Each cylinder has a preferred length of 12 inches and an outside diameter of 3 inches. Furthermore, each cylinder 60 is preferably constructed from a steel pipe filled with concrete. Other cylinder dimensions and constructions, however, are within the scope of the present invention.

Each cylinder 60 is anchored by a plate 62 and adjacent anchoring bolts 64. As noted in Figures 15 and 18, each unit 22 has a series of anchoring bolts 64 positioned within its periphery. More specifically, the elongated side of each unit 22 has three pairs of anchoring bolts 64 positioned within its length. Figures 15 and 18 also illustrate that two pairs of the anchoring bolts 64 are positioned at the ends 34 of the unit 22. These anchoring bolts 64 are employed in interconnecting the ends 34 of adjacent units 22 in the manner illustrated in Figure 19.

With reference to Figure 19 it can be appreciated that the plate 62 is connected to adjacent units 22 by way of anchoring bolts 64. The plate 62 is also connected to the cylinder 60 by way of bolt 72. To facilitate this, the plate 62 includes two pairs of elongated apertures 66 and one central aperture 68. The central aperture 68 allows a bolt 72 to be secured within a threaded aperture of the cylinder 60, while the elongated apertures 66 allow bolts 64 to be secured within apertures within the unit 22. With the units 22 so secured, they are restrained from lateral movement by the anchoring bolts 64 and vertical movement by the cylinder 60.

Other alternative joints are within the scope of the present invention. Namely, male and female joint portions can be formed within the ends 34 of the base 24. Figure 4 illustrates the two ends 34 of the base 24, with a male

joint portion 36 within one end and a female joint portion 38 formed within the remaining end. Preferably in this embodiment, the male joint portion 36 takes the form of an convex arcuate protuberance and the female joint portion 38 takes the form of a concave arcuate protuberance. Each of these joint portions (36 and 38) is preferably integrally formed within the base 24. As can be appreciated, these joint portions (36 and 38) are dimensioned to fit within one another to form a complete joint. This enables adjacent bases 24 to be joined in a seamless manner. In this fashion, the units 22 can be interconnected in end to end relation to form a series and a continuous walkway path 14.

Furthermore, alternative walkway units 22 may include strictly male or female joint portions. With this construction, the units 22 could alternate between male and female joint portions. Thus, either end 34 of a male unit 22 could be interconnected with either end 34 of a female unit 22. Furthermore, the present invention also contemplates using other joining means within the ends of a unit, with the joining means being adapted to interconnect adjacent walkway paths. For example, the male joint portion can take the form of a dowel and the female joint portion can take the form of a dowel aperture. A concrete slurry can be employed to secure adjacent units.

The units 22 can also be interconnected in a non end to end

relationship. Specifically, two units 22 can be interconnected to form a T shape. This is accomplished by interconnecting the end of one unit to the elongated side of an adjacent unit and is illustrated with reference to Figures 15-17. Specifically, the end 34 of one unit 22 is interconnected to the periphery 32 of an adjacent unit by way of an adapter unit 76. The adapter unit 76 is necessary to accommodate for the overhang of the roof 44 overlying each unit 22. Namely, the elongated sides of the roof 44 overhang the base 24 by approximately 12 inches in the preferred embodiment. Consequently, an adapter unit 76 twelve (12) inches in length is needed before the end 34 of a unit 22 can be connected to the periphery 32 of an adjacent unit 22.

In the preferred embodiment the adapter unit 76 includes two ends each with concave female joint portions 78. The adapter unit 76 also has opposing pairs of anchoring bolts 64 formed within its periphery. Consequently, the end 34 of a unit 22 can be interconnected to the end of an adapter 76 in the manner described above in conjunction with Figure 19. However, in order for the adapter 76 to be connected to the elongated side 32 of an adjacent unit 22 a pair of half cylinder connectors 82 must be employed. One such half cylinder connector 82 is illustrated in Figure 20. Each half cylinder connector 82 includes half of a concrete filled steel pipe secured to an angled plate 84. The angled plate 84, in turn, includes two pairs of elongated

apertures 66 which allow the plate 84 to be secured to both an adapter 76 and a unit 22 by way of anchoring bolts 64, note Figure 16. Two such half cylinder connectors 82 are secured to the elongated side of a unit 22 (note Figure 15) to permit the subsequent connection of the adapter 76. Namely, with the half cylinders secured by way of the angled plates 84, the female joint 78 of the adapter 76 can be positioned over the half cylinders. An additional angled plate 86 is secured via the anchoring bolts 64 of the adapter 76, as well as the anchoring bolts 64 of the units 22 being interconnected. Shim plates can be employed to fill any space adjacent the plates. This same interconnection is employed on both sides of the units 22. This interconnection is detailed in Figure 16.

It is also within the scope of the present invention to provide a unit 22 with one or more jointless ends 34. This allows an individual unit to serve as a door stop. For example, a unit 22 with a flat end would allow it to be abutted to the doorway of an adjacent building. The other edges would be exposed and could be adapted for mating relationship with other units 22. The door stop unit could also be adapted to maintain steps to a doorway located either above or below the upper surface 26 of the unit 22.

The end most unit 22 in an interconnected series is preferably sloped to facilitate wheel chair access. Such a sloped unit 88 is depicted in Figures

22 and 23. The majority of the sloped unit 88 is formed from poured concrete in the same fashion as the other units. However, the outermost end of the sloped unit 88 includes steel reinforcing plates 92 to prevent the degradation of the concrete. The sloped unit 88 would likewise include anchoring bolts 64 to allow it to be interconnected to other units in the manner described hereinabove.

With reference to Figure 1, the supports 42 associated with each unit 22 are illustrated. Namely, each walkway unit 22 includes a series of upwardly extending supports 42. The supports 42 preferably take the form of metal poles and are formed within the periphery of the base 24, ideally at its four corners. The supports 42 are employed in supporting a roof 44. As is appreciated from Figure 1, the supported roof 44 is oriented such that it overlies the base 24 to shelter users of the walkway path 14. The roof 44 utilized in this embodiment is rectangular in shape. Preferably, the roof 44 has a triangular profile. Namely, the roof has a central apex 46 with downwardly extending sides 48. This shape allows the roof to easily deflect rain or snow.

The roofs 44 of mating sections can be joined by a roofing adapter 94, note Figure 21. As can be appreciated, the adapter 94 covers the gaps in the roof that might otherwise occur when joining two sections. The adapter 94

can also be angled to accommodate pathways formed upon an inclination.

With reference now to Figure 24, each of the supports is adapted to be interconnected to a lifting eye 96. The lifting eye 96 is depicted with reference to Figures 25-27. Each lifting eye 96 includes a U-shaped sleeve 98 which is adapted to be secured over one of the supports 42. Pins 102 are employed to keep the sleeve 98 positioned around the support 42. The upper extent of each lifting eye has an eyelet 104 formed therein which allows the lifting eye 96 to be connected to a cable. As illustrated in Figure 24, each support 42 is adapted to support a corresponding lifting eye 96 such that cables can be threaded through each of the eyelets 104. In this manner, an entire unit 22 can be lifted by a crane. This allows the units 22 to be easily transported and stored. Thus, the lifting eyes 96 represent one means for interconnecting the completed walkway unit 22 to a means for transport.

Nonetheless, the lifting eye constitutes only one means by which the unit 22 can be interconnected to a means for transport. Other means for interconnecting are also contemplated by the present invention. For example, each walkway unit includes a reinforced roof 44, such that each roof can be engaged by a forklift for lifting and transporting the entire unit, note Figure 13. Furthermore, the lower planar surface 28 of the base 24 provides an additional form of interconnection. Namely, the flat surface 28 allows a

complete walkway unit 22 to be lifted by a forklift 56, or a similar means for transport employing a skid type lifting implement.

In an alternative embodiment, each of the supports 44 includes an upstanding tab 52 at its distal end, with an eyelet 54 formed therein. Figure 13 depicts the eyelets 54, or lifting eyes, which are formed at the ends of the supports 42, with each support 42 having a corresponding tab 52 and eyelet 54. Figure 13 also illustrates how the tabs 52 are positioned through the periphery of the supported roof 44. Although the eyelets 54 have been described in conjunction with the rectangular unit 22, they can be used in conjunction with units of other shapes or sizes. Likewise, if more than four supports 42 are employed by the unit 22, each support 42 could include an upstanding tab 52 and eyelet 54.

The preferred construction of the base 24 is described next in conjunction with Figures 1 and 3. Specifically, the base 24 is constructed from a poured concrete and is ideally reinforced through the use of wire or rebar. However, other reinforcing means known in the art can likewise be used. To ensure the stability of the unit 22 when in place, the preferred weight of the completed concrete base is approximately two tons. It has been found that this weight provides high degree of stability, thereby eliminating the need for grounding means, such as anchors or concrete foundations. At

the same time, however, this weight does not preclude the transport of the units 22 by forklifts or cranes.

The use of a concrete base 24 also allows the upstanding supports 42 to be set within the concrete. As noted from Figure 1, the rectangular unit 22 utilizes four supports 42 set within the concrete. Nonetheless, other numbers of supports 42 can be included, with the number depending upon the particular geometry of the unit 22.

The rectangular embodiments depicted in Figures 1 -3 represent only one of the different walkway geometries that can be employed by the system of the present invention. Figures 8-12 are plan views of additional walkway geometries that can be utilized. For example, Figures 8-10 illustrate a walkway unit 22 which is angled along its length. The walkway of Figure 8 contains a 45 degree angle between its two halves, while the walkway of Figure 9 contains a 90 degree angle. Obviously, units encompassing other angles, such as 30 or 60 degrees, are within the scope of the present invention. As with the rectangular embodiment, the angled units each include two opposing ends which are adapted to be engaged with other walkway units 22. Figure 14 illustrates how angled walkway units could be employed in constructing elongated pathways 14.

Furthermore, although the walkway units have been described as

including two ends 34 for interconnection with two other units, other numbers of ends 34 can be employed. For example, it is within the scope of the present invention to form the walkway 22 in the shape of a T, note Figure 12. Such a shape includes three ends 34, each adapted for interconnection with an adjacent walkway unit 22. Additionally, as is illustrated in Figure 11, it is within the scope of the present invention to employ an intersection walkway. Such a walkway includes four ends 34. Figure 14 illustrates how the intersection walkway and T-shaped walkway would be employed in the construction of longer pathways 14. Lastly, it is within the scope of the present invention to provide walkway units of varying lengths.

As can be appreciated, any of the non rectangular walkway units described hereinabove can be constructed from the same components and materials described in conjunction with the rectangular embodiment of Figure 1. The primary differences between these units 22 being shape of the bases 24 and roofs 44 and the number of supports 42, with the non rectangular embodiments typically employing a greater number of supports 42. For example, the angled units depicted in Figures 8-10 employ additional supports 42 formed at the angled portion of the base 24.

The present invention also relates to a method of interconnecting two or more buildings 12 by way of portable walkways 22. The first step in this

process involves constructing the series of different covered walkway units 22 at a location remote from the buildings to be interconnected. More specifically, the units 22 are constructed at an offsite location. Each of the constructed units 22 includes a concrete base 24 with upstanding supports 42, and a roof 44 interconnected to the upstanding supports 42 overlying the base 24. One or more joint portions are formed within its base 24 which allow the unit 22 to be interconnected to other units 22.

In the next step, the series of walkway units 22 are transported to a location proximate the permanent buildings 12 to be interconnected. Thereafter, one of the walkway units 22 is positioned adjacent a doorway of one of the buildings 12 to be interconnected. Likewise, another of the walkway units 22 can be positioned adjacent a doorway of another of the buildings 12 to be interconnected.

Finally, the joint portions of the remaining walkway units 22 are interconnected such that a continuous walkway path 14 is created (note Figure 14) and such that the walkway units 22 adjacent the doorways are interconnected. The result allows pedestrians to travel between the two doorways by way of a sheltered path 14.

The present disclosure includes that contained in the appended claims, as well as that of the foregoing description. Although this invention has been

described in its preferred form with a certain degree of particularity, it is understood that the present disclosure of the preferred form has been made only by way of example and that numerous changes in the details of construction and the combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention.

Now that the invention has been described,

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